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**Response**

Applicant: Rory A. Heim et al.

Serial No.: 09/851,765

Filed: May 9, 2001

Docket No.: 10006454-1

Title: METHOD AND APPARATUS FOR COMPENSATING FOR INK CONTAINER EXTRACTION CHARACTERISTICS

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**REMARKS**

This Amendment is responsive to the Office Action mailed September 24, 2002, and the Interview Summary mailed October 31, 2002, in which claims 1, 2, 4-14 and 16-21 are rejected, claims 15 and 21 are objected to, and claim 3 is allowed. With this Response, no claims have been amended. Claims 1-21 remain pending in the application and are presented for reconsideration and allowance.

**Claim Rejections under 35 U.S.C. § 102**

The Examiner has rejected claims 1, 2, 4-14 and 16-20 under 35 U.S.C. § 102(e) as being anticipated by Cook, U.S. Patent No. 6,155,664.

Cook is said to disclose all the claimed features of the invention, including an inkjet printing system (Figure 1) configured for receiving a replaceable ink container 2, the replaceable ink container having ink extraction characteristics (ink-specific information) that vary with ink extraction. The inkjet printing system is said to comprise an ink extraction control device (monitoring device) 36 for determining ink extracted from the replaceable ink container (36 monitors ink level 90, 102) and for selecting an ink usage rate print mode (at step 90, monitor 36 selects print primary ink or print secondary ink) from a plurality of different ink usage rate print modes (characteristics of primary and second ink may be slightly different, column 8, lines 31-43, thus having different ink usage rates) based on ink extraction characteristics of the replaceable ink container (ink characteristics affect extraction rate). The Examiner has also detailed how Cook anticipates what is claimed in dependent claims 2, 4-8, 12 and 13.

Independent claim 1 is directed to an inkjet printing system configured for receiving a replaceable ink container, the replaceable ink container having ink extraction characteristics that vary with ink extraction. The inkjet printing system comprises an ink extraction control device for determining ink extracted from the replaceable ink container and for selecting an ink usage rate print mode from a plurality of different ink usage rate print modes based on ink extraction characteristics of the replaceable ink container.

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By adjusting the ink usage rate print mode based upon ink extraction characteristics, ink can be more fully extracted from the replaceable ink container while preventing ink starvation during printing. Because more ink is extracted from the container, the ink container does not need to be replaced as often, thereby reducing the per page printing costs of the printing system and reducing waste. An inkjet printing system of this type is not taught, disclosed or anticipated by Cook.

Cook in Figure 1 is directed to an inkjet printing system that includes an inkjet printhead cartridge 2 having a printhead 24. The printhead cartridge 2 includes an integral primary ink reservoir 4 containing a first quantity of ink that is supplied to the printhead 24. The inkjet printing system further includes a remote ink cartridge 8 having a secondary ink reservoir 10 containing a second quantity of ink. The secondary ink reservoir 10 of the remote ink cartridge 8 is connected to the primary ink reservoir 4 of the inkjet printhead cartridge 2 via supply lines 6, 7 through a flow control device 1 (described with reference numeral 5 in the Cook specification). The printhead cartridge 2 and the remote ink cartridge 8 include memory devices 12 and 14, respectively, which are connected with the flow control device 1 to a controller 36 of the printing system. The controller 36 determines the amount of ink in the primary and the secondary reservoirs 4, 10 to determine when to open the flow control device 1 to refill the primary reservoir 4 from the secondary reservoir 10. If the ink level in the primary reservoir 4 is below a certain minimum threshold, then the reservoir 4 is refilled from the secondary reservoir 10. If the secondary reservoir 10 does not have enough ink to refill the primary reservoir 4, then the printing system shuts down and the user is notified.

As is clear from a complete review of Cook, Cook does not disclose, teach or anticipate what is claimed in independent claim 1. In particular, Cook does not anticipate an inkjet printing system configured for receiving a replaceable ink container having ink extraction characteristics that vary with ink extraction, with the printing system comprising **an ink extraction control device for determining ink extracted from the replaceable ink container, and for selecting an ink usage rate print mode from plurality of different ink usage rate print modes based on ink extraction characteristics of the replaceable ink container.** In Cook, refilling the primary reservoir 4 from the secondary reservoir 10 does

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not require the controller 36 to select an ink usage rate print mode from a plurality of different ink usage rate print modes based on ink extraction characteristics of the replaceable ink container, as set forth in independent claim 1. Simply put, in Cook, there is only a single ink usage rate print mode.

The Examiner has stated the position that Cook teaches a control device 36 for selecting an ink usage rate print mode from a plurality of ink usage rate print modes (primary usage rate versus secondary usage rate) based on ink extraction characteristics of the replaceable ink container (ink usage rates depend on ink characteristics which are different between the primary and secondary inks, column 8, lines 31-43).

The Examiner's position that Cook teaches a control device for selecting an ink usage rate print mode from a plurality of ink usage print modes based on ink extraction characteristics of the replaceable ink container is respectfully traversed. In particular, the Examiner's position that Cook teaches ink usage rates based on ink characteristics which are different between the primary and secondary inks is incorrect. As clearly stated in Cook, to avoid ink mismatches (that is, to avoid differences between the inks), the printhead cartridge 2 and the remote ink cartridge 8 are provided with memory devices in which ink specific information is stored (column 6, lines 27-29). The printing controller 36 performs a process to determine whether the second quantity of ink in the remote ink cartridge 8 is compatible with the first quantity of ink in the printhead cartridge 2 (column 7, lines 41-44). If the ink in the remote ink cartridge 8 is not compatible with the ink in the printhead cartridge 2, then the printing operations stop and the user is prompted to replace the incompatible ink cartridge 8 (see column 8, lines 31-51).

Thus, the controller 36 simply checks the compatibility of the ink colors and formulations in the printhead cartridge 2 and the remote ink cartridge 8. If the inks do not match, then the controller 36 generates a signal to stop the printer operation (column 9, lines 31-33). In each embodiment of the inkjet printing system of Cook, where an incompatibility (that is, a difference) exists between the ink in remote ink cartridge 8 and the printhead cartridge 2, printing operations are stopped by printer controller 36. Thus, Cook teaches that the inks in the remote ink cartridge 8 and the printhead cartridge 2 should not be different for effective printing. In fact, if the ink characteristics are different between the primary and

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secondary inks, the printing system of Cook teaches that printing operations should be stopped.

The Examiner has stated that in Cook "ink usage rates depend on ink characteristics which are different between the primary and secondary inks." However, as detailed above, Cook teaches that there should not be differences between the ink characteristics. Thus, using the Examiner's logic, there cannot be differences in ink usage rates. Thus, the Examiner's position that Cook teaches a control device for selecting an ink usage rate print mode from a plurality of ink usage rate print modes based on ink extraction characteristics of the replaceable ink container is incorrect. In Cook, the controller 36 simply determines whether the primary and secondary inks are compatible, and also determines when to refill the primary reservoir 4 from the secondary reservoir 10.

For the reasons set forth above, Applicants' believe that Cook does not disclose, teach, or anticipate, either implicitly or explicitly, what is claimed by Applicants in independent claim 1. Therefore, Applicants' believe that the rejection of independent claim under 35 U.S.C. § 102(e) has been overcome and should be withdrawn. Such action is respectfully requested.

Claim 9 is directed to an inkjet printing system having a printhead responsive to control signals for depositing ink on media and an ink delivery system for delivering ink to the printhead. The inkjet printing system comprises a monitoring and control device for monitoring ink delivered to the printhead via the ink delivery system, and for adjusting rate of ink extraction from the ink delivery system during a print operation based on ink deposited on media and ink delivered to the printhead.

Again, Cook does not teach, disclose or anticipate an inkjet printing system that includes **a monitoring and control device for monitoring ink delivered to the printhead by the ink delivery system, and for adjusting rate of ink extraction from the ink delivery system during a print operation based on ink deposited on media and ink delivered to the printhead**, as set forth in independent claim 9. As stated above in connection with independent claim 1, the rate of ink extraction in Cook never changes. Whether printing using ink initially in the ink reservoir 4 or ink used to refill the ink reservoir 4 from the secondary ink reservoir 10, the printhead cartridge 2 uses the same ink usage rate. Because

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Cook teaches that the primary and secondary inks must be compatible for printing to occur, differences between the primary and secondary inks which may cause or result in different ink usage rates are not allowed by Cook. As such, Cook can not disclose, teach or suggest, as set forth in independent claim 9, a monitoring and control device for adjusting a rate of ink extraction from the ink delivery system during a print operation based on ink deposited on media an ink delivered to the printhead.

Therefore, for the reasons set forth above, Applicants' believe that Cook does not disclose, teach, or suggest, either implicitly or explicitly, what is claimed by Applicants in independent claim 9. Therefore, Applicants' believe that the rejection of independent claim 9 under 35 U.S.C. § 102(e) has been overcome and should be withdrawn. Such action is respectfully requested.

Independent claims 16 is directed to a method for operating a printing system having a printhead and a supply of ink separate from the printhead. The method comprises determining ink flow from the printhead, determining ink flow from the printhead, determining ink flow into the printhead, and adjusting a rate of ink extraction from the supply of ink during a print operation if ink flow from the printhead exceeds ink flow into the printhead by a threshold amount.

As discussed with regard to independent claim 9 above, Cook does not show, teach, or suggest **adjusting a rate of ink extraction from the supply of ink during a print operation if the ink flow from the printhead exceeds ink flow into the printhead by a threshold amount**. As the language of independent claim 16 is similar to that of independent claim 9, the arguments above directed to independent claim 9 are equally applicable to independent claim 16.

Therefore, for the reasons set forth above, Applicants' believe that Cook does not disclose, teach, or suggest, either implicitly or explicitly, what is claimed by Applicants in independent claim 16. Hence, Applicants' believe the rejection of independent claim 16 under 35 U.S.C. § 102(e) has been overcome and should be withdrawn. Such action is respectfully requested.

Dependent claims 2, 4-8, 10-15, and 17-21 are directly or indirectly dependent upon independent claims 1, 9, and 16. As discussed above, it is believed that independent claims

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1, 9, and 16 are now in condition for allowance. Therefore, consideration and allowance of dependent claims 2, 4-8, 10-15, and 17-21 is also requested.

**Allowable Subject Matter**

In the Office Action and Interview Summary, the Examiner has indicated claim 3 to be allowed, and has indicated that claims 15 and 21 are objected to as depending from a rejected base claim. As claims 9 and 16, from which claims 15 and 21 depend, are in allowable condition, claims 15 and 21 are also believed in allowable condition.

In light of the above, Applicants' believe independent claims 1, 9, and 16 and the claims depending therefrom, are in condition for allowance. Allowance of these claims is respectfully requested.

**CONCLUSION**

Attached hereto is a marked-up version of the changes made to the specification and/or the claims by the current Amendment. The attached pages are captioned "**VERSION WITH MARKINGS TO SHOW CHANGES MADE**".

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Respectfully submitted,

Rory A. Heim et al.,

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Dec. 13, 2002

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CERTIFICATE UNDER 37 C.F.R. 1.8: The undersigned hereby certifies that this paper or papers, as described herein, are being deposited in the United States Postal Service, as first class mail, in an envelope address to: Commissioner for Patents, Washington, D.C., 20231 on this 13<sup>th</sup> day of December, 2002.

By

Name: Matthew B. McNutt